ISO-9001 CERTIFIED MANUFACTURER
GOOD WILL INSTRUMENT CO., LTD.
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NEW TAIPEI CITY, TAIWAN

GPT-9800 Series AC/DC/IR/GB Electrical Safety Tester

New Product Announcement

GWInstek is launching to the market a new series of safety tester with high durability and multiple user-protection design. The GPT-9800 Series look to meet a variety of safety standards such as IEC, EN, UL, CSA, GB, JIS and other safety-related requirements for the safety tests of electronic products and components.

A total of 4 safety testers in the GPT-9800 Series, namely GPT-9804, GPT-9803, GPT-9802 and GPT-9801, are available for various applications. The GPT-9804 is a 4-in-1 model capable of performing AC withstanding, DC withstanding, insulation resistance and ground bond tests. The GPT-9803 is a 3-in-1 model capable of performing AC withstanding, DC withstanding as well as insulation resistance tests. The GPT-9802 is capable of performing both AC and DC withstanding tests, whereas the GPT-9801 is able to perform AC withstanding test. The series of safety tester is built upon a high-efficiency PWM amplifier platform with AC 200VA maximum output capacity to impede the influence from the voltage fluctuation of the input AC source. This ensures a stable voltage supply for all the tests of the GPT-9800 Series.

Targeting user's protections, the GPT-9800 series uses a combination of hardware and software controls to improve safety: A self-check is performed to make sure all the functions and operations are under normal condition each time when the tester is turned on; the Zero Crossing Turn-On design imposes the output voltage to always begin at the zero crossing of a sine wave to avoid the impact of surge voltage output; and the output voltage is automatically cut off (within 150μs) when abnormal output voltages have been detected or when the upper or lower current limits have been reached during testing. To protect operator from hazardous injury, the GPT-9800 Series automatically discharges the DUT after test (within 200ms) each time to eliminate excessive voltage that remains on the DUT. To further ensure safety, the interlock key can also be used as double protections to prevent inadvertent operation.

The GPT-9800 Series, equipped with a simple & clear panel layout, a high resolution dot matrix LCD display, and color LED indicators, allows operators to interpret measurement results easily and quickly. All major test functions, including AC withstanding (AC 5kV/40mA), DC withstanding (DC 6kV/10mA), insulation resistance (DC 50V ~ 1000V) and ground bond (AC 30A max.) tests, are performed under a high-stability voltage output with high-resolution measurement results. Further more, the test duration, ramp up time and upper/lower limits of the output voltage are fully-adjustable to accommodate a wide variety of safety tests with accurate measurement results.

Other functions and features of the GPT-9800 include: open circuit detection for ground bond testing to get correct measurement result with confidence; 100 sets of memory to save panel settings, which can be recalled for single test individually or for automatic tests in sequence; a remote output on-off terminal in the front panel and a signal I/O port in the rear panel provided as the means for remote start/stop control of the safety tester; RS-232C, USB and GPIB (optional) interfaces available for PC remote control and test result logging.

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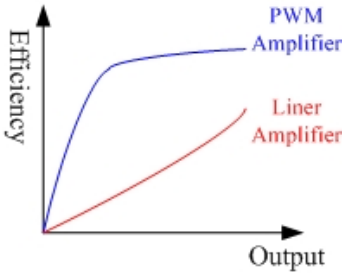
Reliable, Safe, Practical

High Efficiency and High Stability Output



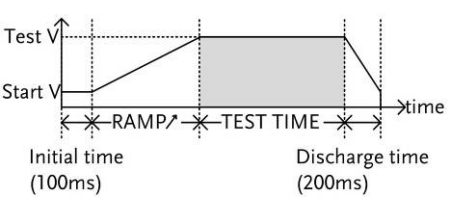
Unlike the conventional safety tester design that uses variable voltage transformer and class AB amplifier to provide testing voltage, the GPT-9800 Series, carrying a high-efficiency PWM amplifier design, generates output source up to 98% efficiency. This greatly reduces the amount of power loss to heat and therefore lowers the temperature within the cabinet of the GPT-9800 Series. The suppression of temperature rise during heavy-duty operations of the tester significantly increases its reliability and service lifetime. In addition, as PWM amplifier is comparatively more resistant to the fluctuations of input power voltage, a stable high-voltage output with less than 1% regulation is provided by the GPT-9800 Series to perform precision tests of the DUT.

High Accuracy and High Resolution Testing Performance

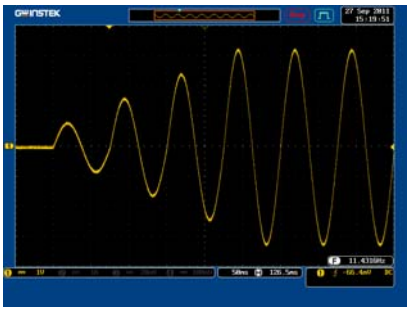
In order to provide high accuracy testing for production test, regulation compliance, and characteristic verification, the withstanding test voltage (AC 5kV/DC 6kV) of the GPT-9800 Series can be adjusted in 2V steps, while the current measurement can be done with 1μA resolution and ±(1.5% + 30μA) accuracy to enable small leakage current measurements of the products or the components. In addition, the test voltage of insulation resistance of the GPT-9800 Series can be adjusted in 50V steps within the DC output range from 50V to 1000V, carrying a measurement accuracy of ±(10% of reading +1 MΩ) at full scale (2000MΩ/9500MΩ). This provides the flexibility for performing I.R. measurements under variable levels of applied voltage. As the majority of safety regulations need an AC source for ground bond testing, the GPT-9800 Series provides 6Vac voltage (open circuit) and 3A~30Aac current for ground bond test, meeting IEC 60601-1 requirements. Furthermore, open circuit detection (via SOURCE H, SENSE H and SOURCE L terminals) for ground bond testing is also provided to check whether the test apparatus is properly connected before the start of a test. This is to ensure the ground bond test is done accurately without any unnoticeable misconnection of the test leads and the test terminals.

With these capabilities, the user is able to perform various safety tests and verifications with high flexibility, accuracy and confidence.

Safety Guarding throughout the Testing Period



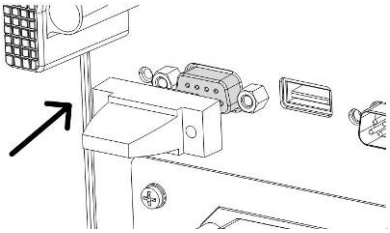
Once the GPT-9800 Series is turned on, the protection functions to protect operator and DUT are always in operation throughout the testing period. When the power is turned on, the GPT-9800 Series immediately goes through the self-check procedures to ensure that all test functions are performed under normal conditions, as the first protection function being applied.



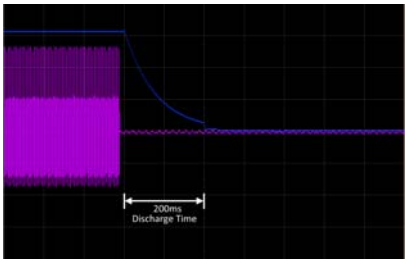
The second protection function is activated once the “Start” (output) button is pressed. At the first moment of start up, the GPT-98000 will send a detection voltage (~100V) during the initialization period (100ms) to check whether the DUT has any short circuit due to poor insulation before the high voltage is applied. This is to prevent high voltage or current from returning to the DUT during the test time. To protect DUT from insulation breakdown caused by the rapid increase of test voltage at power-on and avoid flashover or arcing phenomena that could affect the test results, the GPT-9800 Series has a Zero Crossing Turn-On feature, which ensures the output always starts from the zero crossing of a sine wave. Moreover, the adjustable voltage ramp-up time (0.1s ~ 999.9s) allows the test voltage to slowly rise to the set test voltage to reduce the risk of damaging DUT during mandatory production testing.

Furthermore, after the voltage has ramped to the set test voltage, the GPT-9800 will continue monitoring the voltage and cut off power output once any irregularity is detected. This provides both the safety tester and the operator with a high level protection, which allows the test to be done in a safe and accurate manner.

Multiple Protection Mechanisms



The GPT-9800 series also offers multiple protection designs to ensure operator safety in operating the safety tester. The interlock function provides the hardware key protection for voltage output. When the interlock function is activated, the testing voltage will present at the output ONLY when the dedicated interlock key is attached to the Signal I/O port on the rear side. When the test is not intended to executed, removing the interlock key can inhibit the voltage output to prevent the hazard of high voltage output. Except connecting with the key, two inputs of the Signal I/O port can be connected alone to a senor switch installed in safety test system. If there is any unexpected object is detected to intrude into the system, the output is disabled and thus prevents the operator from exposure to hazardous voltages/currents.



In addition, the GPT-9800 series can quickly cut off the high voltage output within 150μs when the test has completed, the high/low limits have been reached or the emergent stop caused by an abnormal situation. Lastly, when a test has stopped, the unit also automatically discharges the voltage across the DUT (within 200ms) to reduce the risk of injury to operator.

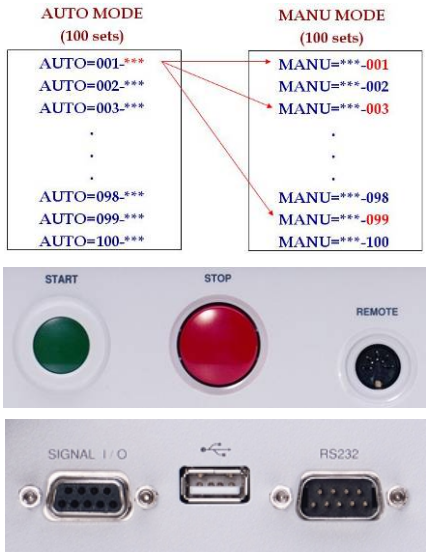
Friendly User Interface

The 240 x 64 LCD displays not only the setting parameters but also the test conditions, measurement values and DUT inspection results (PASS or FAIL) in a legible pattern. The LED indicators in different colors alert the operator to the status of the safety tester to avoid any possible risk. For example, the status indicator sitting above the high voltage output terminal will automatically blink

when a high voltage presents at output. In addition, the function keys arranged below the LCD display provide convenient operation that test setup can be easily done by fewer key punches.

Convenient Manual and Automated Test

In order to comply with all safety regulations, the GPT-9800 series also offers a large number of memory locations (100 sets in total) to store a variety of test conditions. When a test condition is saved to one of the 100 fixed memory locations, a unique test file name (up to 12 characters) can also be assigned to its memory location. For example, the test file name “IEC61010AH” (IEC61010 AC Withstanding test) can saved and recalled for future use. Any test conditions that have been previously stored can be used for a single test or combined together for automatic testing- eliminating the need to perform a series of tests manually.



In addition to using the START/STOP buttons on the front panel to control the safety tester, the GPT-9800 series also provides a remote terminal for connection to an external remote controller and a signal I/O port on the rear panel for connection to a PLC interface for actuator control. Furthermore with RS-232C and USB as standard (GPIB optional) for all the models in the GPT-9800 series, retrieving test data and results is convenient via a PC connection.

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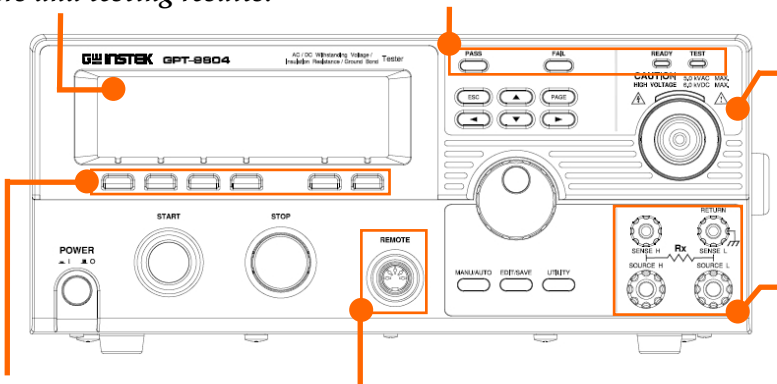
Key Features

- 200VA AC Test Capacity
- 240x64 Ice Blue Dot matrix LCD
- Manual/Auto Mode
- Function Key for quick selecting
- High intensity flash for Caution & Status indication
- Safety INTERLOCK function
- Zero Crossing Turn-on Operation
- Controllable Ramp-up Time
- True RMS Current Measurement
- High resolution: 1uA for measuring current, 2V for setting voltage
- PWM switching amplifier to enhance the power efficiency and reliable testing
- Max. 100 memory block for test condition (step) setting. And each step can be named individually.
- Remote terminal on the front panel for “start”, “stop” and “remote active check”
- Interface : RS-232C, USB device, Signal I/O and GPIB (optional)

240 x 64 Ice Blue Matrix LCD display, supporting a grater view of setting parameters and testing results.

High Intensity LED Indictors to show the status of safety tester.



High Voltage Output for AC 5kV, DC 6kV or 50V~1000V in 50V per step for Insulation Resistance testing.

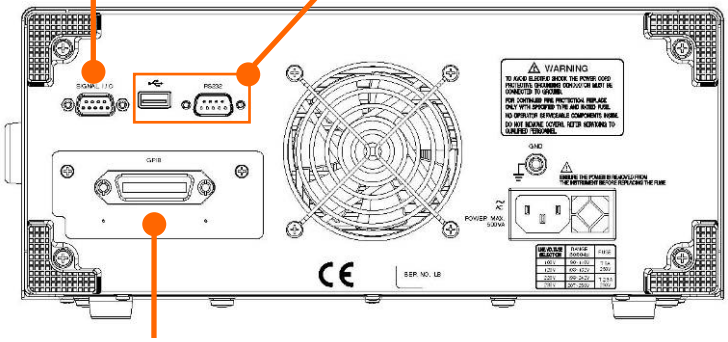
High Current Output up to 30A ac for 4 wires Ground Bond testing.

Quickly selecting Function keys, corresponding to the functions or parameters display on the screen.

Remote Terminal provides “start” and “stop” control by an external controller.

The Signal I/O port provides remotely “start” and “stop” function and monitor the test status of the tester.

USB and RS-232 communication ports facilitate the easy & convenient communication.



GPIB communication is supported as optional.

Application and Target Markets

■ *Production and Compliance Testing of electrical products*

- Power Cord
- House Appliances
- Information Technology Equipment
- Medical Equipment

- 240 x 64 matrix LCD display and high intensity status indicators for clear and easy observation.
- Variety safe considerations, fast cutoff / protective Interlock key/ discharge after testing, to ensure the safety of operator.
- PWM amplifier design to ensure the precision tests of the DUT and the reliability and service lifetime of tester.
- Various control methods, manual / remote terminal / signal I/O, to fit with the actual requirement of workplace environment.
- Testing condition reserved up to 100 sets memory for multi-production.
- Up to 16 reserved testing conditions can be combined as sequence testing.
- Remote Communication ports, RS-232C/ USB device/ GPIB(optional), retrieving test data and results is convenient via a PC connection.

■ *Quality Assurance Verification*

- 240 x 64 matrix LCD display and high intensity status indicators for clear and easy observation.
- Various control methods, manual/remote terminal/signal I/O, to fit with the actual requirement of workplace environment.
- Testing condition reserved up to 100 sets memory for multi-production.
- Up to 16 reserved testing conditions can be combined as sequence testing.
- Remote Communication ports, RS-232C/ USB device/ GPIB(optional), retrieving test data and results is convenient via a PC connection for further analysis.

■ *Development validation*

- 240 x 64 matrix LCD display and high intensity status indicators for clear and easy observation.
- High testing performance, 2V/step for withstanding output voltage adjustment and 50V/step for insulation resistance voltage output setting, to verify the capability of electrical product or component.
- Remote Communication ports, RS-232C/ USB device/ GPIB(optional), retrieving test data and results is convenient via a PC connection for further analysis.

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Key Dates for Product Announcement

	GPT-9803/9802/9801	GPT-9804
1. Order Queue Open	7th of Nov. 2011	15th of Nov. 2011
2. Distributor Announcement	7th of Nov. 2011	7th of Nov. 2011
3. Global Market Announcement	7th of Nov. 2011	7th of Nov. 2011
4. Demo Units Shipped to Distributors	15th of Nov. 2011	30th of Nov. 2011
5. Mass Quantity Order Fulfillment	1st of Dec., 2011	

Service Policy

1) **2 year warranty**

2) **Service Support**
   The service instructions in the Service Manual will help distributors repair defective units promptly. Should a board replacement be necessary to fix a defective unit, a board swapping service is provided by Good Will Instrument to facilitate the repairs done at a distribution site.

3) GW Instek continues to provide the after sales support through its website. The most updated version of the service manual and Marcom material for GPT-9800 series will be posted on the distributor zone of GW Instek Website at http://www.gwinstek.com.

Should you have any questions about the GPT-9800 series announcement, please don't hesitate to contact us.

Sincerely yours;

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GPT-9800 series Specification

Environment

Note	• To operate the GPT-9800 series over the specific temperature range may cause damage to the circuit. And, do not use the GPT-9800 series in a place where strong magnetic or electric field exists.
Warranty Environment	15°C to 35°C, Humidity ≦70% (no condensation)
Operation Environment	0°C to 40°C, Humidity ≦70% (no condensation)
Storage Environment	-10°C to 70°C, Humidity ≦85% (no condensation)
Installation Location	Indoors at an amplitude of up to 2000m

General

Note	• The specifications apply when the GPT-9800 series are powered on for at least 30 minutes at 15°C~35°C.
Display	240 x 64 Ice Blue dot matrix LCD
Memory	100 memory blocks each for AUTO and MANU mode
Interface	RS232C, USB device, Signal I/O and GPIB (option)
Power Source	AC 100 V / 120 V / 220 V / 230 V ±10%
Power Line Frequency	50/60Hz
Power Consumption	Max 500VA
Dimensions	330(W) x 150(H) x 460(D) mm
Weight	Approx. 15kg max. for GPT-9803/9802/9801 Approx. 19kg max. for GPT-9804

AC Withstanding Voltage [1]

Output-Voltage Range [2]	0.100kV~ 5.000kV
Output-Voltage Resolution	2V/step
Output-Voltage Accuracy	± (1% of setting + 5V) with no load
Maximum Rated Load [3]	200 VA (5kV/40mA)
Maximum Rated Current	40mA (0.5kV＜V≦5kV) 10mA (0.1kV≦V≦0.5kV)
Output-Voltage Waveform	Sine wave
Output-Voltage Frequency	50 Hz / 60 Hz selectable
Voltage Regulation	± (1% reading + 5V) [Maximum rated load ->no load]
Voltmeter Accuracy	± (1% of reading + 5V)
Current Measurement Range	0.001mA~40.0mA
Current Best Resolution	0.001mA(0.001mA~0.999mA) 0.01mA(01.00mA~09.99mA) 0.1mA(010.0~040.0mA)
Current Measurement Accuracy	±(1.5% of reading + 30uA)
Window Comparator Method	Yes
ARC Detect	Yes
RAMP (Ramp-Up Time)	0.1s~999.9s
TIMER (Test Time) [4]	OFF, 0.5s~999.9s
GND	RETURN/GUARD

[1] Applicable to all models.
[2] The maximum adjustable voltage to AC 5.100kV.
[3] Output Limitation in AC Withstanding Voltage Testing as below.

	Upper Current	Pause	Output Time
AC	30mA≦I≦40mA	At least as long as the output time	Approx. 240 seconds
	0.001mA≦I<30mA	Not necessary	Continuous output possible

[4] The timer can only be turned off when the tester is in special MANU mode (MANU=***-000)

DC Withstanding Voltage [1]

Output-Voltage Range [2]	0.100kV~ 6.000kV
Output-Voltage Resolution	2V/step
Output-Voltage Accuracy	± (1% of setting + 5V) with no load
Maximum Rated Load [3]	50W (5kV/10mA)
Maximum Rated Current	10mA (0.5kV＜V≦6kV) 2mA (0.1kV≦V≦0.5kV)
Voltage Regulation	± (1% of reading + 5V) [Maximum rated load ->no load]
Voltmeter Accuracy	± (1% reading + 5V)
Current Measurement Range	0.001mA~ 10.0mA
Current Best Resolution	0.001mA(0.001mA~0.999mA) 0.01mA(01.00mA~09.99mA) 0.1mA(010.0mA)
Current Measurement Accuracy	±(1.5% of reading + 30uA)
Window Comparator Method	Yes
ARC Detect	Yes
RAMP (Ramp-Up Time)	0.1s~999.9s
TIMER (Test Time) [4]	OFF, 0.5s~999.9s
GND	RETURN/GUARD

[1] Applicable to GPT-9804/9803/9802.
[2] The maximum adjustable voltage to DC 6.100kV.
[3] Output Limitation in DC Withstanding Voltage Testing as below.

	Upper Current	Pause	Output Time
DC	0.001mA≦I≦10mA	Not necessary	Continuous output possible

[4] The timer can only be turned off when the tester is in special MANU mode (MANU=***-000)

Insulation Resistance [1]

Output Voltage	50V~1000V	
Output-Voltage Resolution	50V/step	
Output-Voltage Accuracy	± (1% of setting +5V)	
Resistance Measurement Range	1MΩ~ 9500MΩ	
Test Voltage	Measure Range	Accuracy
50V≦ V <500V	1~50MΩ 51~2000MΩ	± (5% of reading + 1 MΩ) ± (10% of reading + 1 MΩ)
500V≦ V ≦1000V	1~500MΩ 501~9500 MΩ	± (5% of reading + 1 MΩ) ± (10% of reading + 1 MΩ)
Voltage Regulation	± (1% reading + 5V) [Maximum rated load ->no load]	
Window Comparator Method	Yes	
RAMP (Ramp-Up Time)	0.1s~999.9s	
TIMER (Test Time)	1s~999.9s	

[1] Applicable to GPT-9804/9803

Ground Bond [1]

Output-Current	03.00A~30.00A
Output-Current Resolution	0.01A
Output-Current Accuracy	3A≦I≦8A：±(1% of reading + 0.2A) 8A<I≦30A：±(1% of reading + 0.05A)
Test-Voltage	6Vac max.
Test-Voltage Frequency	50Hz/60Hz selectable
Resistance Measurement Range	0.1mΩ~ 650.0mΩ
Resistance Measurement Resolution	0.1mΩ
Resistance Measurement Accuracy	± (1% of reading + 2 mΩ)
Window Comparator Method	Yes
TIMER (Test Time)	0.5s~999.9s
Test Method	Four terminal test mode

[1] Applicable to GPT-9804 only

Product Outlook

GPT-9804

GPT-9803/9802/9801

Real Panel

(For all models with optional GPIB)

Ordering information

GPT-9804	**AC 200VA AC/DC Withstanding Voltage/ Insulation Resistance / Ground Bond Tester**
GPT-9803	**AC 200VA AC/DC Withstanding Voltage/ Insulation Resistance Tester**
GPT-9802	**AC 200VA AC/DC Withstanding Voltage Tester**
GPT-9801	**AC 200VA AC Withstanding Voltage Tester**

Included Accessories

Quick Start Guide x 1,
CD x1(completed user manual)
Power cord x 1,
Interlock key x 1,
Remote terminal male plug x 1,
Test lead GHT-114 x 1 for GPT-9803/9802/9801
Test lead GHT-114 x 1, GTL-115 x 1 for GPT-9804

Option

Opt.1 GPIB card

Optional Accessories

GHT-113	High Voltage Test Pistol
GHT-205	High Voltage Test Probe
GTL-232	RS232C Cable, 9-pin Female to 9-pin, null Modem for Computer
GTL-247	USB Cable, A-A type, approx. 1.8m
GTL-248	GPIB Cable, approx. 2m
GRA-402	RACK Adapter Panel (19”, 4U)

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Replacement Information

New Model	Replacement
GPT-9804：AC+DC+IR+GB	GPI-745A
GPT-9803：AC+DC+IR	GPI-735A and GPI-725A
GPT-9802：AC+DC	GPT-715A
GPT-9801：AC	GPT-705A

After GPT-9800 series launched, the GPT/GPI-700A series is going to be phase-out. The above table shows the replacement between models. For difference between this two series, please refer to the comparison below.

Comparison of GPT-9800 vs. GPT/GPI-700A

		GPT-9800		GPT/GPI-700A	
AC Withstanding	Output-Voltage Range	0.100kV~ 5.000kV ac		0.100kV~ 5.000kV ac	
	Output-Voltage Resolution	2V/step		5V/step	
	Output-Voltage Accuracy	± (1% of setting + 5V) [no load]		------	
	Maximum Rated Load	200 VA (5kV/40mA)		200 VA (5kV/40mA)	
	Maximum Rated Current	40mA (0.5kV< V ≦5kV) 10mA (0.1kV≦ V ≦0.5kV)		40mA (0.5kV< V ≦5kV) 10mA (0.1kV≦ V ≦0.5kV)	
	Output-Voltage Waveform	Sine wave		Sine wave	
	Output-Voltage Frequency	50 Hz / 60 Hz selectable		50 Hz / 60 Hz selectable	
	Voltage Regulation	± (1% of reading + 5V) [full load → no load]		± (1% of reading + 5V) [full load → no load]	
	Voltmeter Accuracy	± (1% of reading + 5V)		± (1% of reading + 10V)	
	Current Measurement Range	0.001mA~40.0mA		0.1mA~40.0mA	
	Current Best Resolution	0.001mA / 0.01mA /0.1mA		0.02mA	
	Current Measurement Accuracy	±(1.5% of reading + 30uA)		±(1.0% of reading + 80uA)	
	Window Comparator Method	Yes		Yes	
	ARC Detect	Yes		Yes	
	RAMP (Ramp-Up Time)	0.1s~999.9s		0s~999.9s	
	TIMER (Test Time)	OFF, 0.5s~999.9s		OFF, 0.5s~999.9s	
	GND	RETURN/GUARD		RETURN (fix)	
DC Withstanding	Output-Voltage Range	0.100kV~ 6.000kV dc		0.100kV~ 6.000kV dc	
	Output-Voltage Resolution	2V/step		5V/step	
	Output-Voltage Accuracy	± (1% of setting + 5V) [no load]		------	
	Maximum Rated Load	50W (5kV/10mA)		60W (6kV/10mA)	
	Maximum Rated Current	10mA (0.5kV< V ≦6kV) 2mA (0.1kV≦ V ≦0.5kV)		10mA (0.5kV< V ≦6kV) 2mA (0.1kV≦ V ≦0.5kV)	
	Voltage Regulation	± (1% of reading + 5V) [full load → no load]		± (1% of reading + 5V) [full load → no load]	
	Voltmeter Accuracy	± (1% of reading + 5V)		± (1% of reading + 10V)	
	Current Measurement Range	0.001mA~ 10.0mA		0.1mA~ 10.0mA	
	Current Best Resolution	0.001mA /0.01mA /0.1mA		0.01mA	
	Current Measurement Accuracy	±(1.5% of reading + 30uA)		±(1% of reading + 50uA)	
	Window Comparator Method	Yes		Yes	
	ARC Detect	Yes		Yes	
	RAMP (Ramp-Up Time)	0.1s~999.9s		0s~999.9s	
	TIMER (Test Time)	OFF, 0.5s~999.9s		OFF, 0.5s~999.9s	
	GND	RETURN/GUARD		RETURN (fix)	
Insulation Resistance	Output Voltage	50V~1000V dc		50V/100V/500V/1000V	
	Output-Voltage Resolution	50V/step		------	
	Output-Voltage Accuracy	± (1% of setting + 5V)		------	
	Resistance Measurement Range	1MΩ~ 9500MΩ		1MΩ~ 9500MΩ	
	Test Voltage	Measurable Range	Accuracy	Measurable Range	Accuracy
	50V≦ V <500V	1~50MΩ 51~2000MΩ	±(5% of reading + 1 MΩ) ±(10% of reading + 1 MΩ)	1~50MΩ 51~200MΩ 201~2000MΩ	±(5% of reading + 1 MΩ) ±(10%of reading + 1 MΩ) ±(20% of reading + 1 MΩ)
	500V≦ V ≦1000V	1~500MΩ 501~9500MΩ	±(5% of reading + 1 MΩ) ±(10% of reading + 1 MΩ)	1~500MΩ 501~2000MΩ 2001~9500MΩ	±(5% of reading + 1 MΩ) ±(10% of reading + 1 MΩ) ±(20% of reading + 1 MΩ)
	Window Comparator Method	Yes		Yes	
	RAMP (Ramp-Up Time)	0.1s~999.9s		------	
	TIMER (Test Time)	1s~999.9s		1s~999.9s	
	GND	GUARD (fix)		RETURN (fix)	

GW INSTEK
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Comparison of GPT-9800 vs. GPT/GPI-700A			
		GPT-9800	**GPT/GPI-700A**
Ground Bond	Output-Current	03.00A~30.00A ac	03.00A~42.00A dc
	Output-Current Resolution	0.01A	0.02A
	Output-Current Accuracy	3A≦I≦8A：±(1% of reading + 0.2A) 8A<I≦30A：±(1% of reading + 0.05A)	±(1% of reading + 0.2A)
	Test-Voltage	6Vac max (open circuit)	8Vdc max. (open circuit)
	Test-Voltage Frequency	50Hz/60Hz selectable	------
	Resistance Measurement Range	0.1mΩ~ 650.0mΩ	0.1mΩ~ 600.0mΩ
	Resistance Measurement Resolution	0.1mΩ	0.1mΩ
	Resistance Measurement Accuracy	±(1% of reading + 2 mΩ)	±(1% of reading + 3 mΩ)
	Window Comparator Method	Yes	Yes
	TIMER (Test Time)	0.5s~999.9s	0.5s~999.9s
	Test Method	Four Terminal	Four Terminal
Continuity Check	Output-Current range	------	0.1A dc
	Compliance Voltage range	------	10%
	Resolution	------	0.1Ω @ 1Ω
Memory	Single step memory	MANU：100 blocks	COM only
	Automatic testing memory	AUTO：100 blocks, manu per auto：16	Groups：10, steps per group：16
Interface	RS-232C	Standard	Standard
	USB	Standard	------
	GPIB	Option	Option
	Remote terminal (Front)	Standard	------
	Control I/O (Rear)	Signal I/O	Remote I/O
	Scan	------	Standard
	Rear Output	------	GPI-745A only
Display		240 x 64 Ice Blue Dot matrix LCD	24 x 2 character LCD

[Note1]：GPT-9800 series does not support continuity check function.

[Note2]：The scanner box, HSB-001-1/HSB-001-2, can not work with GPT-9800 series.

Red indication for the better features